TMA solutions

TMA Wi-Fi HaLow

Industrial automation control system

IP-based wireless sensor networks

Rural internet access

Low-power sensor networks

Surveillance cameras and sensors

TMA Wi-Fi Halow Applications
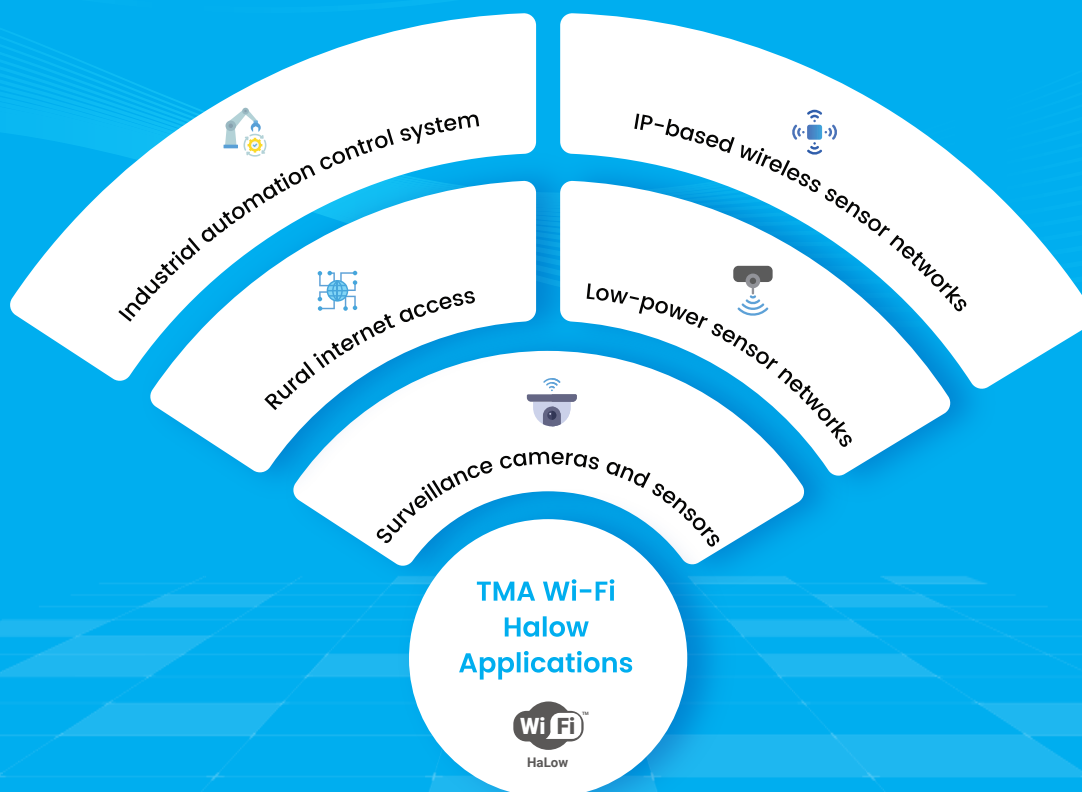
Wi Fi™ HaLow

Why Wi-Fi Halow?

Long range coverage ~1 Km	Optimized for energy efficiency
High Data-rate application with low latency	Ultra-dense deployment (up to 8000 devices per SSID)
Penetration through walls and obstacles	Wi-Fi enhanced encryption with WPA3

Services

Software and Firmware Development & Testing

Provide the full lifecycle of software and firmware development, from initial concept through to testing and deployment.

PoC/Prototype Implementation

From feasibility study, R&D to prototype implementation. AI-enabled IoT use cases or applications implementation.

Wi-Fi IoT Solution Implementation

Build IoT applications and solutions based on customer's hardware/ modules.

Technologies

Wi-Fi HaLow – IoT
802.11ah

Traditional Wi-Fi
802.11n, ac, ax, be

Programming
C/C++, Python, Bash shell

Operation Systems
Linux, Ubuntu, Raspbian, OpenWRT

Protocols
TCP, UDP, SCTP, IP

Linux Kernel/Drivers
Linux wireless driver, Linux mac80211 module

RTOS
FreeRTOS, Zephyr

Communication Interfaces
SDIO, SPI, PCI, USB

Hardware
Khadas VIM4 SBC board, ALFA WiFi HaLow HAT Dev Board, Raspberry Pi, MorseMicro MM610x, Newracom HaLow

Smart Wireless Camera Solution

- **Wireless video camera solution for indoor/ outdoor buildings, schools, factories, stadiums, etc.**
- **Enhanced surveillance and control in restricted zones**

Smart Building & Industry Park

Wi Fi
HaLow

INDUSTRY 4.0

Database/ Server Administration
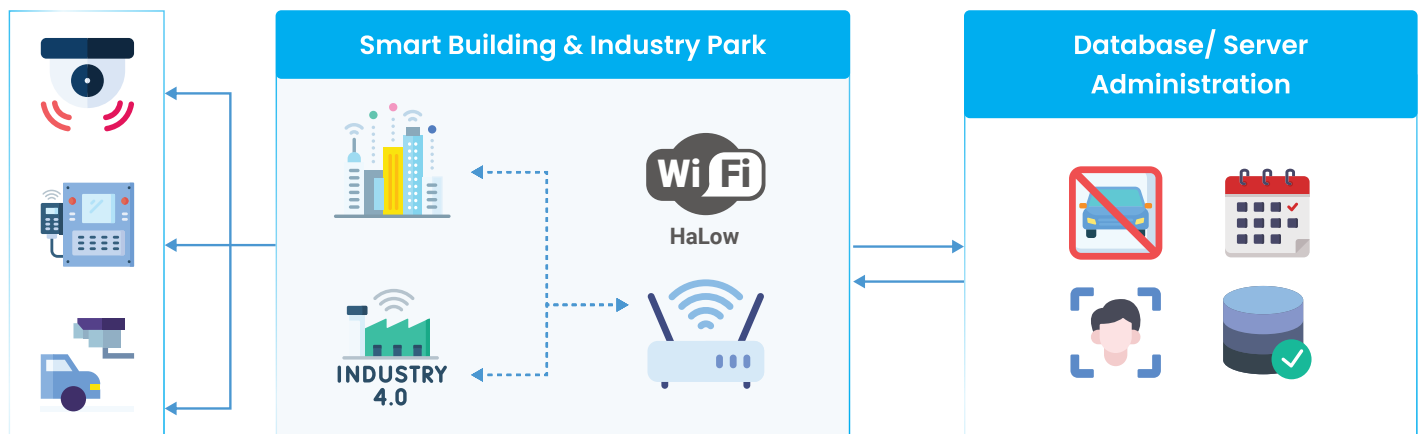
Key Benefits

- **High performance:** Covering medium ranges of 50-150 meters; Excellent Video Clarity within 50-70 meters; Beyond this range, Wi-Fi HaLow surpasses LoRaWAN and conventional Wi-Fi, ensuring high-speed data connectivity.

- **Cost-effective alternative:** Compared to cellular networks for wide-area coverage.

- **Scalable solution:** Ability to support multiple cameras

Environment Monitoring Solution

- **Weather and environmental monitoring for farms, factories, schools, buildings, etc.**

Industrial/ Software Park

Database/ Server Administration

Wi Fi HaLow

INDUSTRY 4.0
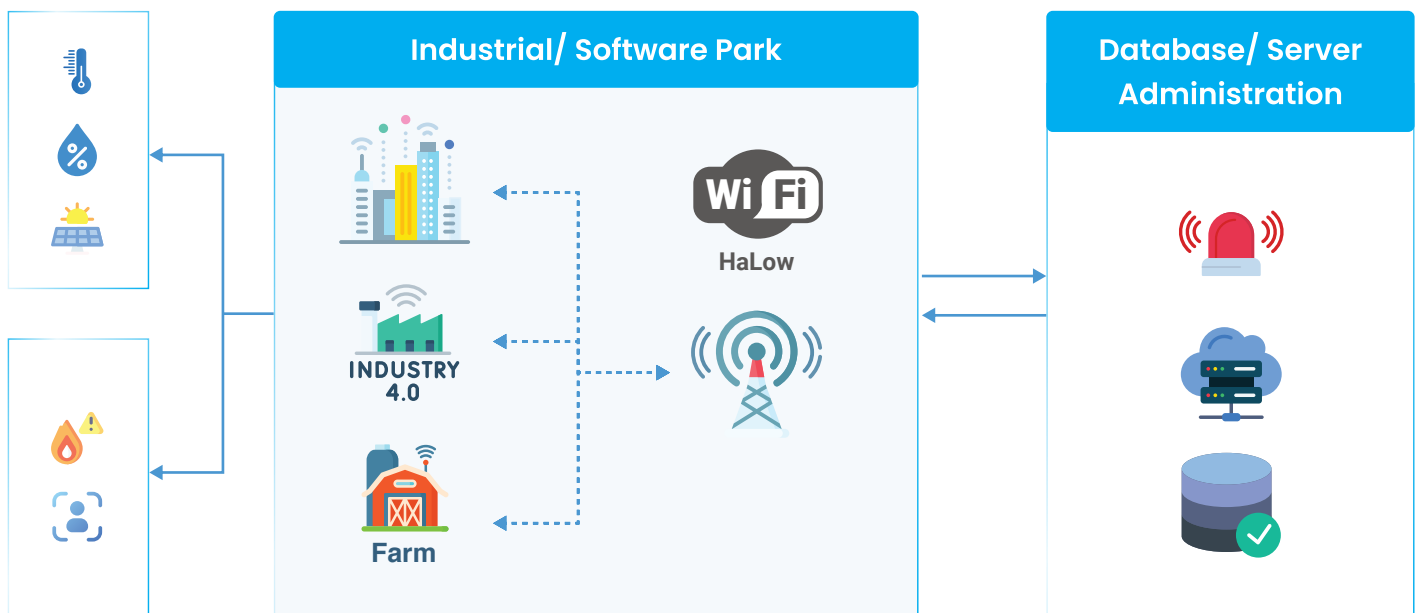
Farm

Key Benefits

- **Cost-effective monitoring:** Wi-Fi HaLow provides a more budget-friendly solution compared to cellular networks (LTE/5G) for localized environmental monitoring within industries and farms.

- **Simplified deployment:** Leveraging existing Wi-Fi infrastructure in industrial facilities or agricultural operations can be easier with Wi-Fi HaLow compared to deploying entirely new network solutions

- **Scalable network:** Ability to support many devices

Wearable Security Camera Solution

- **A safety and security solution uses wearable devices connected to traditional Wi-Fi or Wi-Fi HaLow network**

Security Guard and Body Camera

Wi Fi
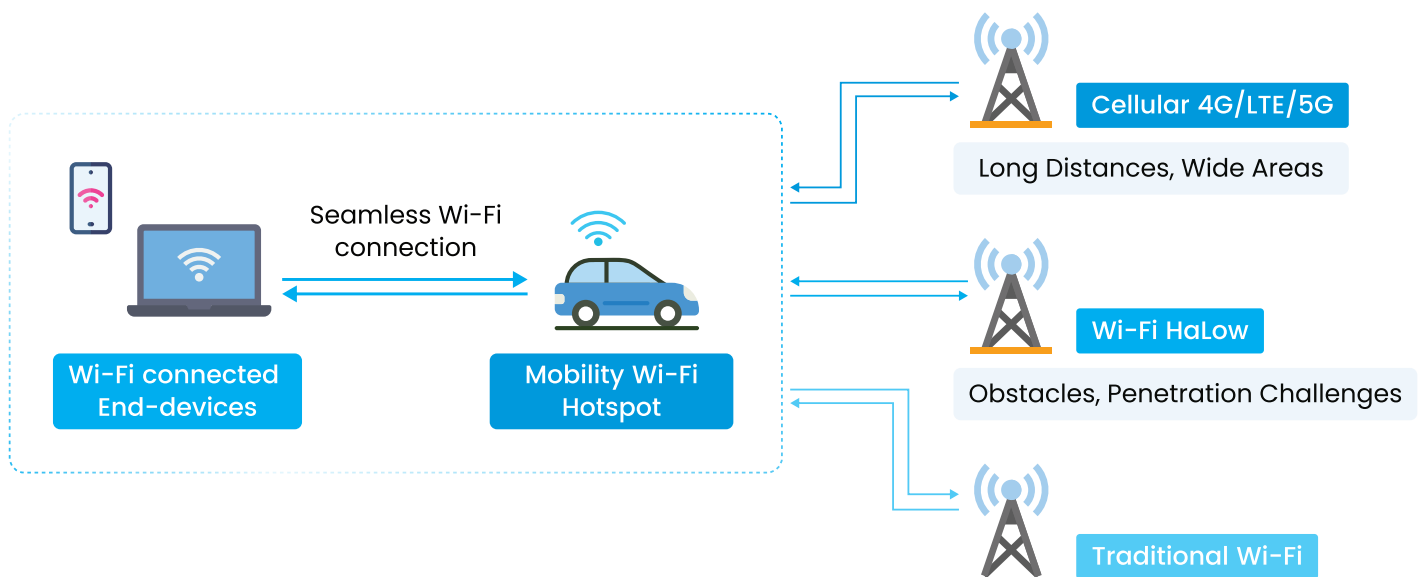HaLow

Adminstration
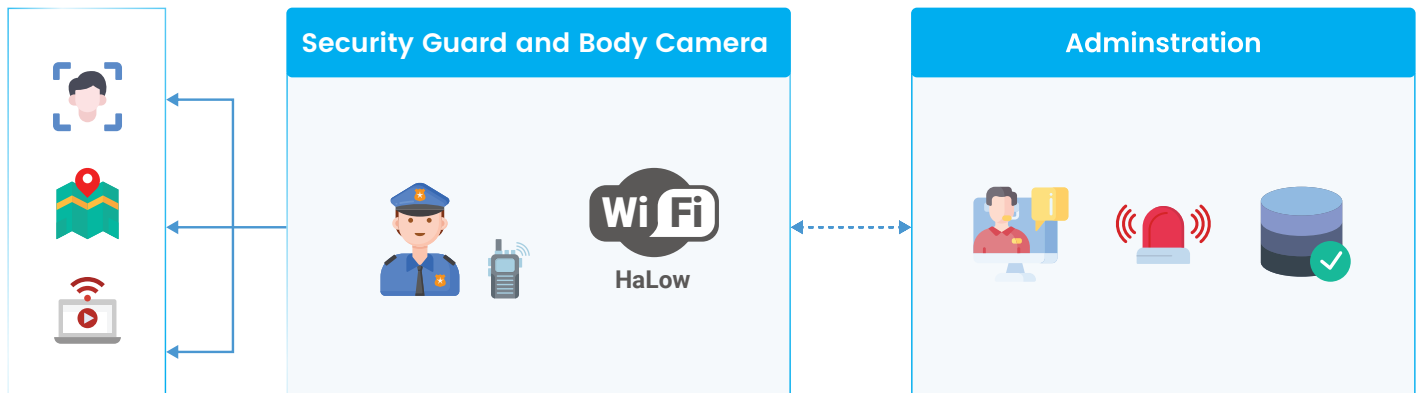
Key Benefits

- **Outperform Bluetooth & Zigbee:** Longer range, higher data rates, Covering medium ranges of 50-150 meters, Good penetration over obstacles, Covers more area with fewer cameras.

- **Lower Power:** Extended battery life for wearable devices.

- **Reliable:** Fewer signal drops, uninterrupted surveillance.

- **Scalable:** Ability to support multiple cameras

- **Cost-Effective:** Compared to cellular networks.

Adaptive Connection for Wi-Fi Hotspot Solution

- **Path selection and switchover among Cellular 4G/LTE/5G, Traditional Wi-Fi, and Wi-Fi HaLow interfaces with minimal service interruptions**

Wi-Fi connected End-devices — Seamless Wi-Fi connection — **Mobility Wi-Fi Hotspot**

Cellular 4G/LTE/5G
Long Distances, Wide Areas

Wi-Fi HaLow
Obstacles, Penetration Challenges

Traditional Wi-Fi

Key Benefits

- **Enhanced user experience:** Deliver a consistent and high-quality experience by maintaining stable Wi-Fi calling and internet connectivity across various network paths.

- **Optimal network performance:** Automatically select the most effective network path (e.g., 4G/LTE/5G, Wi-Fi) to maximize throughput and performance.

- **Increased mobility:** Support smooth connectivity for users and devices moving across large areas, such as campuses, public venues, and urban environments

- **Reduced reliance on expensive mobile data:** Wi-Fi reduces dependence on expensive mobile data plans, allowing users to save money and connect more freely.